

# Accuracy of Laparoscopic Diagnosis of Endometriosis

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## ABSTRACT

**Background and Objective:** Laparoscopy is the standard method to visually identify endometriotic lesions under magnification within and outside the minor pelvis. The aim of this study was to analyze the accuracy of laparoscopic visualization in diagnosing the various endometriotic sites as confirmed histologically.

**Method:** Presumed endometriotic sites were observed in 164 patients operated on under the clinical suspicion of endometriosis. Targeted biopsies were performed for histologic corroboration, comparing the laparoscopic findings and diagnosis to the histological results.

**Result:** The histological reports of the biopsies confirmed the presence of endometriosis in 138 patients (84.1%), but in 26 patients (15.9%), no evidence of endometriosis was observed. 100% of "red" lesions, 92% of "black" lesions, and 31% of "white" lesions turned out to be endometriosis. Of the 264 various suspected endometriotic sites observed, 142 (53.8%) were confirmed histologically. The most accurate diagnosis was in lesions on the parietal peritoneum of the pelvis, confirmed in 9/9 cases (100%); the ovarian fossa, confirmed in 8/12 cases (66.7%); and the uterosacral ligaments and posterior surface of the broad ligament, confirmed in 83/138 cases (60.1%). As for the other sites, the histologic confirmation rates in the ovarian surface, bowel serosa, and vesicouterine fold of the peritoneum were 48%, 40%, and 13%, respectively.

**Conclusion:** Endometriosis has a multiple appearance, and the lesions may be confused with nonendometriotic lesions. It is clear that a nonhistology-based diagnosis may lead to unnecessary prolonged medical treatment and operations and may delay the proper treatment measures from being applied. Therefore, a meticulous histological confirmation should still be the first step in the laparoscopic

diagnosis and treatment of suspected endometriosis.

**Key Words:** Endometriosis, Laparoscopy, Histology.

## INTRODUCTION

Early and accurate diagnosis of endometriosis may improve the quality of life of patients and provide cost-effective and long-lasting treatment. Various methods are available to diagnose endometriosis as a genetic, immunologic, and endocrine-based disease. Although suspicion of endometriosis may be diagnosed with the patient's history and complaints; physical examination, especially the rectovaginal palpation; imaging techniques, such as ultrasound, MRI and computerized tomography (CT); and large, nonspecific tumor markers, such as CA 125, dysmenorrhea, dyspareunia, and chronic abdominal pain, a certain diagnosis can be verified only by histological examination. Laparoscopy is the standard method for visually identifying the endometriotic lesions under magnification within and outside the minor pelvis, and for performing targeted biopsies for histologic corroboration.<sup>1,2</sup> Various published reports have shown that the presence of endometriosis observed at laparoscopy or laparotomy could be confirmed histologically in the majority of cases.<sup>2-6</sup> Yet, the drawbacks of performing a laparoscopic diagnosis derive from the diversity of endometriotic appearances according to the site of the endometriotic lesion. For example, in a frozen pelvis, adhesions may completely cover endometriotic lesions. It is the aim of this study to analyze the value of laparoscopy in diagnosing the various endometriotic sites as confirmed histologically.

## MATERIALS AND METHODS

### Patients

Laparoscopic data on 164 endometriosis patients recorded in the German Complications Register were analyzed, comparing the laparoscopic description to the histological data. The German Complications Register is a computerized database established by the Institute of Natural Intelligence in Bremen, which compiles data from 41

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German endoscopic surgery centers. In our evaluation, however, only the data from the Department of Obstetrics and Gynecology at the University of Kiel were evaluated. The evaluation period was from January 1998 until September 2000.

### Laparoscopic Approach

All 164 patients were operated on under the clinical suspicion of endometriosis, comparing the laparoscopic findings and diagnosis to the histological results. Laparoscopy was performed with the patient under general anesthesia. Magnification was used to obtain a better view of the abdominal wall and the organs of the minor pelvis. Under observation, any lesion was taken as suspicious for endometriosis. To verify the diagnosis, biopsies were taken by grasping the "red," "black," or "white" lesion and punching it out with punch biopsy forceps. The biopsy wounds were then coagulated either by endocoagulation<sup>7</sup> or by bipolar coagulation. In cases of ovarian endometriomas, the cysts were enucleated in the typical manner in an attempt to extract the endometriotic lesion. The base of the ovarian wound was endocoagulated at 80° to 100°C, and in most cases, the wound edges were coapted with endosutures by utilizing an extracorporeal knotting technique.<sup>8</sup>

### Classification of Endometriosis

Laparoscopically, the endoscopic endometriosis classification<sup>9</sup> was applied. This classification is comparable to the AFS Classification.<sup>10</sup> In our cases, the aim was to excise all visible red, black, or white endometriotic lesions and to verify the diagnosis histologically. The histologic diagnosis of endometriosis was determined by the presence of endometrial glands, stroma, fibrosis, and hemosiderin-carrying macrophages.<sup>4</sup>

### RESULTS

The majority of patients, 98 (59.8%), had stage I endometriosis, 14 (8.5%) had stage II, 28 (17%) stage III, and 24 (14.6%) stage IV endometriosis (**Table 1**). The majority of patients, 111 (67.7%), were found to have multiple lesions, and 53 (32.3%) had single lesions (**Table 2**).

**Table 3**, arranged according to the site of the endometriosis, reveals that of the 264 stated sites in 164 patients (multiple sites included), lesions in the uterosacral ligament and the posterior surface of the

broad ligament, suspected laparoscopically in 138 cases, were confirmed histologically in 83/138 (60.1%). Lesions on the ovarian surface were confirmed in 37/77 cases (48%); they were all black lesions. Lesions on the vesicouterine fold of the peritoneum were confirmed in only 3/23 cases (13%). Lesions in the ovarian fossa were confirmed in 8/12 cases (66.6%). Lesions in the parietal peritoneum of the pelvis were confirmed in all 9 cases. Lesions of the bowel serosa were confirmed in 2/5 cases (40%). Altogether, of the 264 various suspected endometriotic sites observed, 142 (53.8%) were confirmed histologically. Yet, when the confirmation of endometriosis in the evaluated patients is considered, the histological reports of the biopsies demonstrated endometriosis with or without fibromuscular, fibrofatty, or fibrovascular tissue in 138/164 patients (84.1%). In 26/164 patients (15.9%), no evidence of endometriosis was observed, only fibrous tissue with fat and smooth muscle (**Table 4**), although one may argue that some of the fibrotic lesions may derive from endometriotic damage. All (82) of the red lesions biopsied were endometriosis. In 69% (22) of the white lesions and in 8% (4) of the black lesions, no endometriosis was histologically detectable.

### DISCUSSION

The laparoscopic diagnosis of endometriosis as described in the literature varies widely because of the presence of a wide range of presumably characteristic lesions.<sup>1-3,11-13</sup> The promptness and accuracy of diagnosis is an important contribution to the application of early treatment and the prevention of scarring and adhesion and compromise of fertility.

Usually the laparoscopic diagnosis derives from the identification of the typical black or dark bluish or deep red spots on the peritoneal surface. One can easily miss the presence of endometriosis when a less marked discoloration is present. These "faint" lesions described by Jansen and Russel<sup>11</sup> include white opacification of the peritoneum, red flame-like lesions, yellowish patches, peritoneal defects, and adhesions. These lesions may be more common and possibly more active than the dark lesions.<sup>11,14,15</sup> An exfoliative cytologic examination was also applied in an attempt to widen diagnostic accuracy. It was shown to be of no value in the diagnosis, because in 46.5% of cases with positive histology the peritoneal aspirates failed to reveal the characteristics of

endometriosis.<sup>5</sup> Furthermore, our study demonstrates that even in the face of presumably certain endometriosis, as judged by the operators, histology failed to confirm endometriosis in almost half of the sites, and we could not describe any appearance to be a symptom of endometriosis. Nevertheless, the overall diagnostic accuracy of the presence of endometriosis in the operated on patients was high, because in 138/164 patients (84.1%), histology corroborated the laparoscopic diagnosis of endometriosis in the patients.

A careful inspection of the peritoneum and laparoscopic magnification may help in the detection of minor lesions,<sup>16</sup> but laparoscopic magnification may also contribute to the over diagnosis that we have observed in this study.

Obviously, some endometriotic lesions are more easily recognized than others, especially the scarred blue/black, red, and brown lesions resulting from the accumulation over time of blood pigments, but a diversity of peritoneal lesions exists that may be mistaken for endometriotic lesions. Among these are chronic inflammation, foreign body reaction (black punctations resulting from the reaction to previous sutures), electrocautery and laser carbonized burns, metastases of ovarian and breast cancer, epithelial inclusions, hemangiomas, and others.<sup>2,12,16</sup> Another confounding factor for the laparoscopic diagnosis may be the frequent combination of endometriosis with smooth muscle or fibrofatty tissue observed in half of the patients, 82 (50%) (**Table 3**), confirming previous observations.<sup>1</sup> In our study, as clearly demonstrated in **Table 4**, endometriosis was histologically determined mainly in red and black lesions, but seldom in white lesions. No histological verification of endometriosis was obtained in 26 patients (15.9%). Of these 26 patients, 4 had black lesions; and 22 had white fibrous lesions.

As for the sites of lesions, it was previously demonstrated that the most common site of endometriosis is on the uterosacral ligaments.<sup>12</sup> This was corroborated by our study, because of the suspected endometriotic sites by laparoscopy on the uterosacral ligaments and the posterior surface of the broad ligament, suspected in 138/264 cases (52.3 %), 83/264 (31.4%) were confirmed histologically. The low incidence of confirmation of endometriotic lesions on the vesicouterine fold of the peritoneum could be attributed to too careful and superficial sampling. Obviously, our results do not refer to deep infil-

trating endometriotic lesions and microscopic implants, not being appreciated visually. In this study, no effort was made to differentiate between active and passive endometriosis; however, more histologically detectable lesions were found in red, followed by black, and least frequently in white lesions.

## CONCLUSION

Endometriosis has a multiple appearance, and the lesions may be confused with other nonendometriotic lesions, as well as endometriotic lesions that are nonendometriotic by appearance or deep infiltrating ones that may be missed on visual diagnosis. It is also clear that a nonhistology-based diagnosis may lead to unnecessary, prolonged medical treatment and operations and may delay the proper treatment measures from being applied. Therefore, a meticulous histological confirmation should still be the first step in the laparoscopic diagnosis and treatment of suspected endometriosis.

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